

WHAT IS CLAIMED IS:

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1. A lamp device for a vehicle comprising:  
a light source;  
a reflector in which a reflection surface is a free  
5 curved surface;  
a lens having no prism; and  
a reflected light by said reflector transmitting  
through said lens so as to be irradiated to an external section  
in accordance with a target light distribution pattern,  
10 wherein said lens is formed in a convex shape in a  
vertical cross section and a horizontal cross section.

2. The lamp device for a vehicle according to claim 1,  
wherein the reflection surface of said reflector is  
15 structured such that the vertical cross section and the  
horizontal cross section are formed in a substantially  
hyperboloidal surface smaller than said lens.

3. The lamp device for a vehicle according to claim 1,  
20 wherein a free curved surface formed on the reflection  
surface of said reflector is a non-uniform rational B-spline  
surface (NURBS).

4. The lamp device for a vehicle according to claim 2, wherein a free curved surface formed on the reflection surface of said reflector is a non-uniform rational B-spline surface (NURBS).

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5. The lamp device for a vehicle according to claim 1, wherein a torus curved surface or a free curved surface is formed on a front surface or/and a back surface of said lens.

10 6. The lamp device for a vehicle according to claim 2, wherein a torus curved surface or a free curved surface is formed on a front surface or/and a back surface of said lens.

15 7. The lamp device for a vehicle according to claim 3, wherein a torus curved surface or a free curved surface is formed on a front surface or/and a back surface of said lens.

20 8. The lamp device for a vehicle according to claim 4, wherein a torus curved surface or a free curved surface is formed on a front surface or/and a back surface of said lens.

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